

Report
On
Faculty Development Programme
On
Patenting Technology and Process
Innovations Related to Renewable Energy

February 17 - 22, 2021

Organized by
Department of Power Engineering,
and
School of Nuclear Studies & Applications,
Jadavpur University, Salt Lake Campus
Kolkata – 700106

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INTRODUCTION

Innovation is the seed of an enterprise in today's world. Very often innovation lurks in activities which appear to be extremely routine and remains undetected because of the common notion of associating innovation with a product rather than a process. An introspection, therefore, is imperative to find out what is innovative in what one does routinely and if there exists something innovative, what is its business potential. Patentability follows as a natural corollary.

The Energy sector in this country, and also worldwide, is passing through a rapid and dynamic shift from the conventional to the renewables energy resources, warranting new technologies and game-changing innovations cutting across the conventional fields of mechanical, electrical and power engineering and the allied areas. The need for identifying the scopes and prospects of innovative ideas in the energy sector cannot therefore be overemphasized.

With this idea, the Department of Power Engineering and the School of Nuclear Studies & Application, Jadavpur University, organised a *Faculty Development Program on Patenting Technology and Process innovations Related to Renewable Energy* from **February 17th to 22nd, 2021** where field experts disseminated the importance and role of innovations in the rapidly transitioning energy sector. The program involved patent facilitators sharing their expertise to present a framework to faculty researchers in the domain of Power and Energy so that they can identify innovations in their ongoing research works - be it something as routine as a load flow study or an energy audit. This served as a forum where experienced researchers presented their research as case studies to the development of novel materials for sustainable energy solutions. The programme ended with an interaction session between patent facilitators and experts managing university-based technology transfer.

LIST OF SPEAKERS

The programme involved lectures by patent facilitators and eminent researchers from different reputed institutes. The participants would be able to identify the scopes and prospects of innovation in the energy sector on successful completion of the course.

List of the speakers were

Prof. Suman Chakraborty, Department of Mechanical Engineering, IIT Kharagpur

Dr. Mahuya Hom Chowdhury, Patent Information Centre, State Council of Science & Technology, Govt. of West Bengal

Prof. Ratan Mondal, School of Energy Studies, Jadavpur University

Prof. Biswajit Ghosh, Vice Chancellor, Neotia University

Prof. Amitava Gupta, Department of Power Engineering, Jadavpur University

Prof. Ranjan Ganguly, Department of Power Engineering, Jadavpur University

Mr. Ayush Sharma, Patent Facilitator, New Delhi

Mr. Sankar Nath Mukhopadhyay Head, Asia Institute of Power Management, CESC Ltd.

Prof. Achintya Mukhopadhyay, Department of Mechanical Engineering, Jadavpur University

Prof. Bireswar Majumder, Department of Power Engineering, Jadavpur University

Mr. Subhajit Ghosh, Head of Energy, Resource, Utilities, Infrastrure, Tata Consultancy Services

Ms. Divya Singh, Patent Facilitator, Hyderabad

Prof. Kamal Krishna Mondal, Department of Power Engineering, Jadavpur University

Prof. Pallab S. Mahapatra, Department of Mechanical Engineering, IIT Madras

Prof. Kaushik Saha, Centre for Energy Studies, IIT Delhi

Ms. Ushashi Banerjee, Manager, Infrastructure Government Healthcare - Strategy and Transformation, KPMG

Prof. Subhrangshu Sanyal, Calcutta Innovation Park, IIM Kolkata

Mr. Ayush Sharma, Patent Facilitator, New Delhi

Prof. Sayan Chatterjee, Department of Electronics and Tele Communication Engineering, Jadavpur University

PROGRAMME SCHEDULE

The Faculty Development Programme was held on 17th February to 22nd February 2021 at 11.00 am to 5.30 pm in non-contact online virtual mode (through google meet platform). The meeting for the entire training programme was <https://meet.google.com/zmf-yuub-sbq>

Day	Date	Time	Topic	Speaker
	Day 1 (17/02/2021)	11.00 am– 11.30 am	Inauguration	Pro Vice Chancellor and Coordinator of TEQIP-III, Prof. Amitava Datta , Dean of Faculty of Engineering and Technology, Prof. Sudipta De , Nodal Officer (Academic) TEQIP-III, JU, Prof. Amitava Gupta , Head of the Department of Power Engineering and Director of School of Nuclear Studies & Applications, colleagues and all the participants from various organizations
		11.30 am– 1.30 pm	Surface Science on Energy-water Nexus and the Odyssey of a Naïve Researcher in the IP World	Prof. Ranjan Ganguly , Department of Power Engineering, Jadavpur University
		2.00 pm– 4.00 pm	Intellectual Property Rights in Shaping the Future Perspective and Challenges : Special Emphasis on Renewable Energy Patent Analysis	Dr. Mahuya Hom Chowdhury , Patent Information Centre, State Council of Science & Technology, Govt. of West Bengal
		4.00 pm– 5.30 pm	Scope and Possibilities of Renewable Based Energy System & Some Studies on Technology and Process Innovation for Solar Energy Application	Prof. Ratan Mandal , School of Energy Studies, Jadavpur University
2.	Day 2 (18/02/2021)	11.00 am– 1.00 pm	TCS Innovation and IP Management Framework and Research Areas in Electric Power Market and Transactive Energy	Mr. Subhajit Ghosh , Head of Energy, Resource, Utilities, Infrastructure, Tata Consultancy Services
		2.00 pm– 4.00 pm	Energy Technologies: Research, Innovation and Intellectual Property Right	Prof. Biswajit Ghosh , Vice Chancellor, The Neotia University
		4.00 pm– 5.30 pm	Indian Small Hydropower - Overview and Government Policies	Prof. Bireswar Majumder , Department of Power Engineering, Jadavpur University
3.	Day 3 (19/02/2021)	11.00 am– 1.00 pm	Indian Power Sector, Sustainable Growth and Patenting Issues	Mr. Sankar Nath Mukhopadhyay Head, Asia Institute of Power Management, CESC Ltd.
		2.00 pm– 3.30 pm	Optization and Renewables	Prof. Kamal Krishna Mondal , Department of Power Engineering, Jadavpur University
		3.30 pm–	University Innovation	Prof. Amitava Gupta , Department of

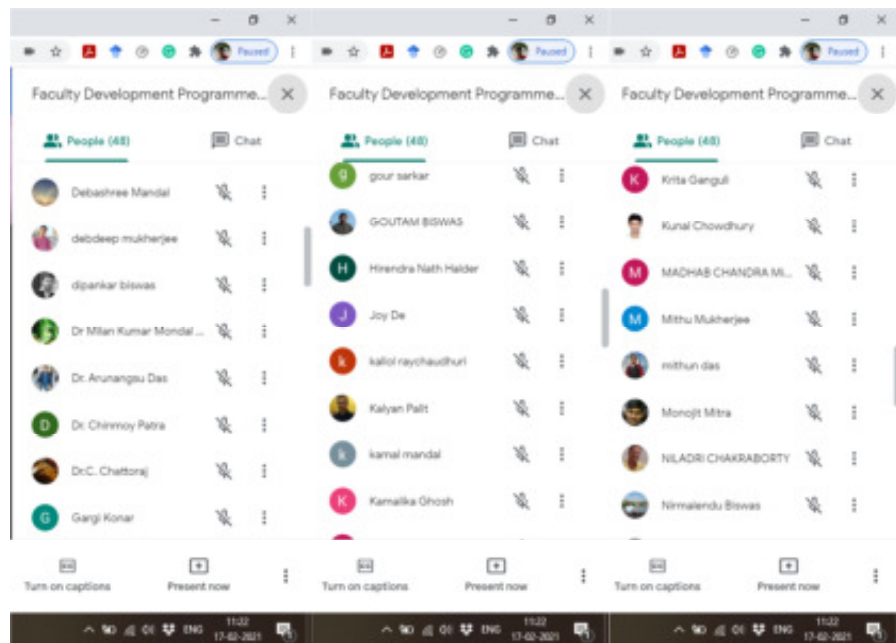
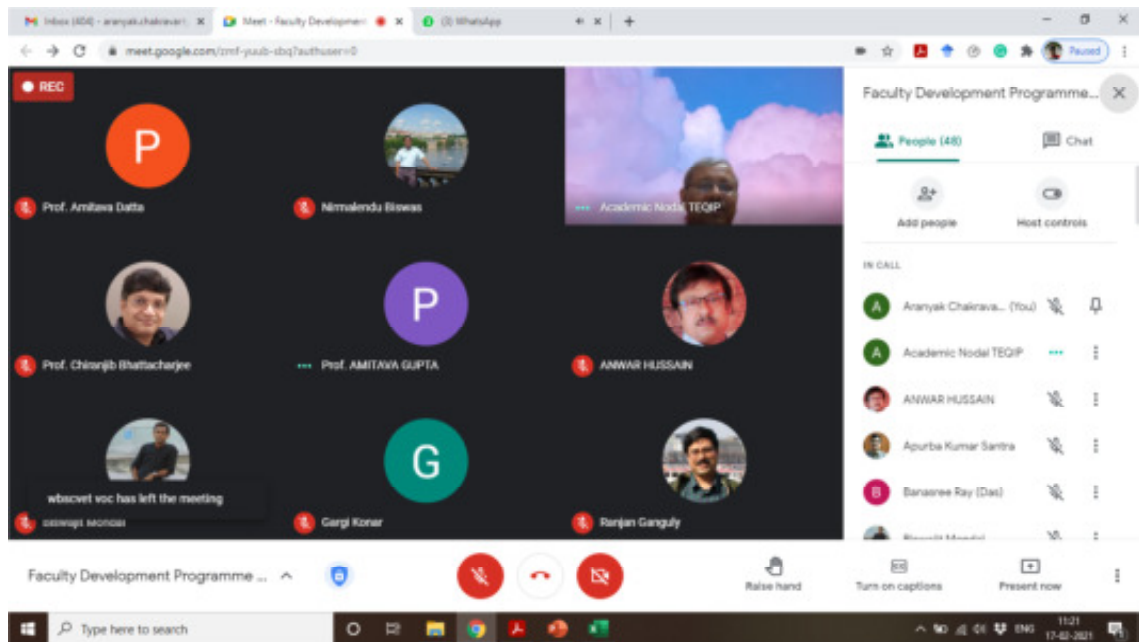
Day	Date	Time	Topic	Speaker
		5.00 pm	Landscape in India and Patenting in Renewables	Power Engineering, Jadavpur University
4.	Day 4 (20/02/2021)	11.00 am– 1.00 pm	Innovations in Product Development – Examples and Case Studies	Prof. Suman Chakraborty , Department of Mechanical Engineering, IIT Kharagpur
		2.00 pm– 4.00 pm	Patent Procedure in India	Ms. Divya Singh , Patent Facilitator, CSIR-CCMB, Hyderabad
		4.00 pm – 5.30 pm	Using Sights and Sound to Access the Behavior of Complex System: Innovative Use of Inexpensive Sensors	Prof. Achintya Mukhopadhyay , Department of Mechanical Engineering, Jadavpur University
5.	Day 5 (21/02/2021)	11.00 am– 1.00 pm	Patents and Process Innovations: a Perspective	Prof. Pallab S. Mahapatra , Department of Mechanical Engineering, IIT Madras
		2.00 pm– 4.00 pm	Utilization of High-Performance Computing for Internal Combustion Engines	Prof. Kaushik Saha , Centre for Energy Studies, IIT Delhi
		4.00 pm– 5.30 pm	India's Energy Transition	Ms. Ushashi Banerjee , Manager, Infrastructure Government Healthcare - Strategy and Transformation, KPMG
6.	Day 6 (22/02/2021)	11.00 am– 1.00 pm	Taking Innovation from Lab to Market	Prof. Subhrangshu Sanyal , IIM Innovation Park, IIM Kolkata
		2.00 pm– 4.00 pm	Ride the Clean Energy Protection Wagon	Mr. Ayush Sharma , Patent Facilitator, New Delhi
		4.00 pm– 5.00 pm	Question – answer session	Dr. Mahuya Hom Chowdhury , State Council of Science & Technology, WB Prof. Sudipta De , Academic Nodal Officer – TEQIP, JU Prof. Achintya Mukhopadhyay , Dept. of Mechanical Engineering, JU Prof. Amitava Gupta , Dept. of Power Engineering, JU Prof. Ranjan Ganguly , Dept. of Power Engineering, JU Prof. Ratan Mondal , School of Energy Studies, JU Prof. Sayan Chatterjee , Dept. of Electronics and Tele Communication Engineering, JU

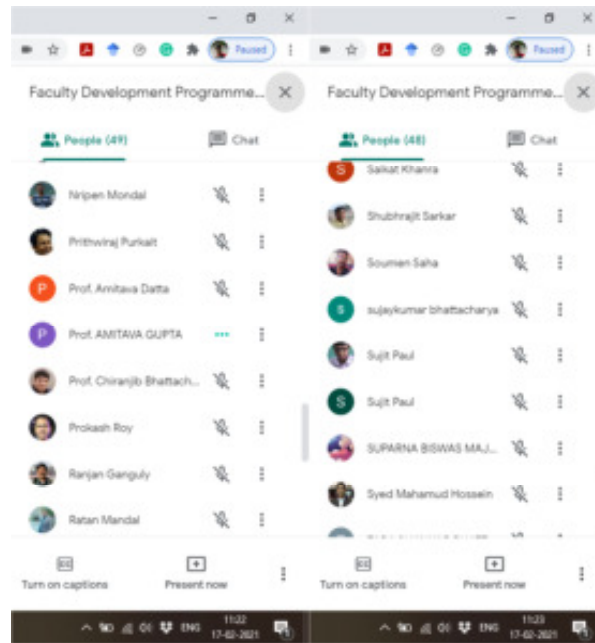
SUMMARY OF THE EVENTS

Day 1

- **Inauguration**

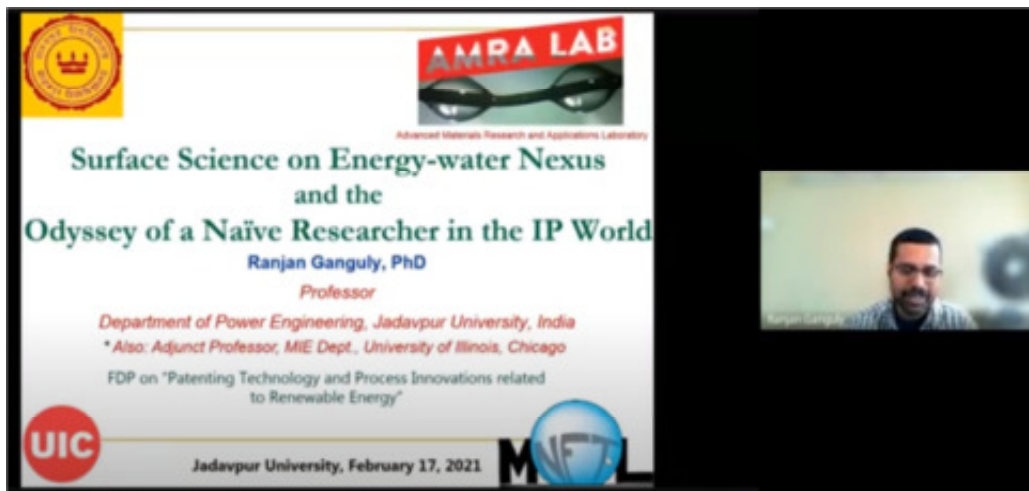
All the faculty members, along with the Prof. Chiranjib Bhattacharjee (Pro-VC & Co-ordinator TEQIP-III), Prof. Sudipta De (Academic Nodal Officer TEQIP-III) and Prof. Amitava Datta (Dean, FET), interacted with the participants and highlighted the importance and salient objectives of the faculty development programme. List of the participants through the google meet are given below:





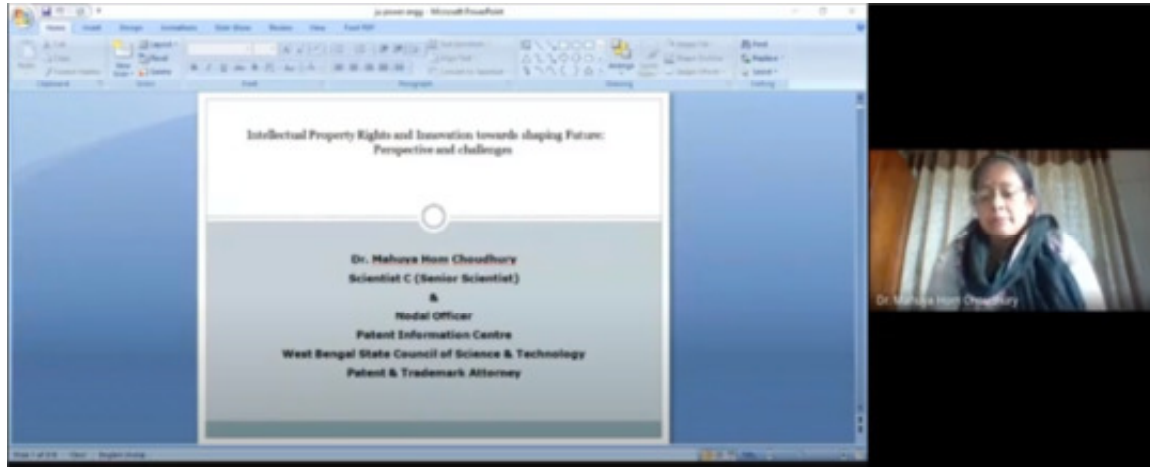
- ***Surface Science on Energy-water Nexus and the Odyssey of a Naïve Researcher in the IP World by Prof. Ranjan Ganguly***

Prof. Ganguly presented his research on surface and wettability engineering and its application in the context of renewable energy. He also presented different case studies regarding patenting based on his own experience.



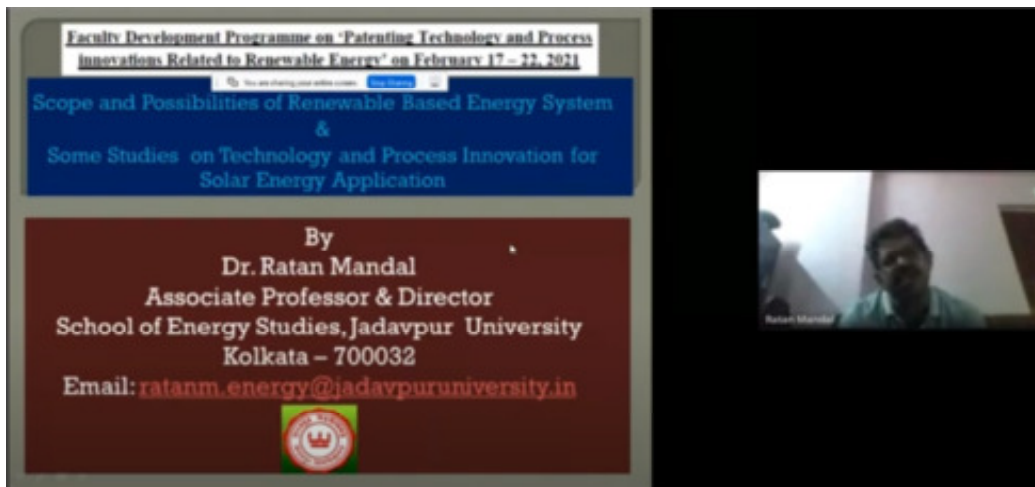
- ***Intellectual Property Rights in Shaping the Future Perspective and Challenges : Special Emphasis on Renewable Energy Patent Analysis by Dr. Mahuya Hom Chowdhury***

Dr. Hom Chowdhury discussed the basic requirements and purpose of patenting as well as the process involved in obtaining a patent. Different case studies were presented to make the participants develop a sound understanding of the patenting process.



- ***Scope and Possibilities of Renewable Based Energy System & Some Studies on Technology and Process Innovation for Solar Energy Application by Prof. Ratan Mandal***

Prof. Mandal presented different developments related to solar energy applications including his own research.



Day 2

- ***TCS Innovation and IP Management Framework and Research Areas in Electric Power Market and Transactive Energy by Mr. Subhajit Ghosh***

Mr. Ghosh discussed different technological developments and IP management issues related to electric power market and renewable energy.



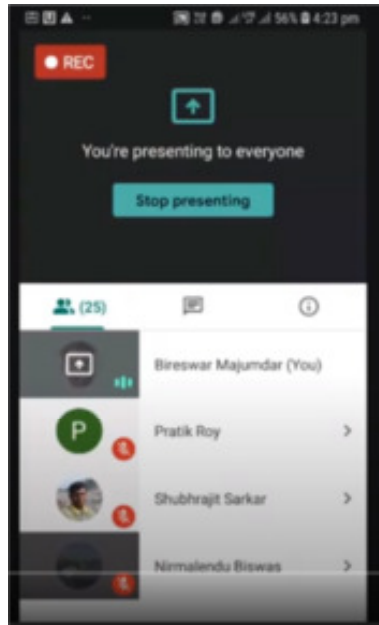
- ***Energy Technologies: Research, Innovation and Intellectual Property Right by Prof. Biswajit Ghosh***

Prof. Ghosh discussed in detail his experience of research on different energy technologies and also his collaborative works with various national and international organisations related to renewable energy. He also shared his views on intellectual property rights based on different case studies.



- ***Indian Small Hydropower - Overview and Government Policies by Prof. Bireswar Majumder***

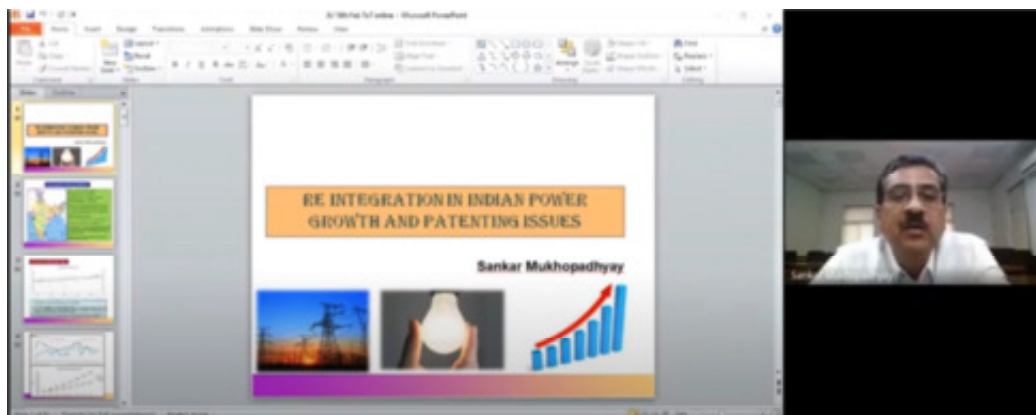
Prof. Majumder shared his experience about the development of lab-based hydro-electric power generation and potential future scope of work in this area. He also discussed about his research on wind energy utilization.



Day 3

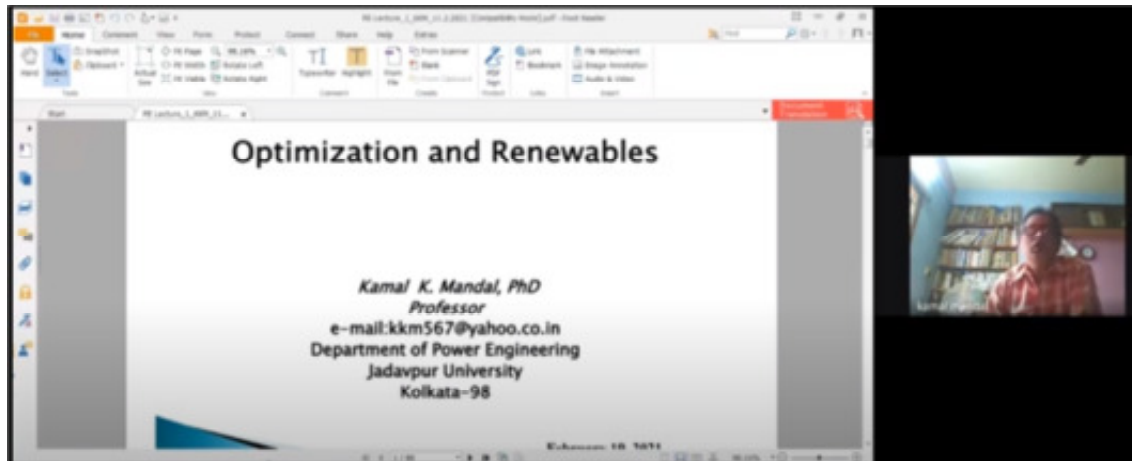
- ***Indian Power Sector, Sustainable Growth and Patenting Issues by Mr. Sankar Nath Mukhopadhyay***

Mr. Mukhopadhyay discussed about the historical development of thermal power generation, transmission and distribution in India, and recent progresses in smart grid systems utilizing renewable energy sources.



- ***Optimization and Renewables – by Prof. Kamal Krishna Mandal***

Prof. Mandal described different optimization techniques that can be applied to renewable energy systems.



- ***University Innovation Landscape in India and Patenting in Renewables – by Prof. Amitava Gupta***

Prof. Gupta discussed the scope of innovation in the higher education system of India and the direction that should be followed for obtaining patents related renewable energy applications.



Day 4

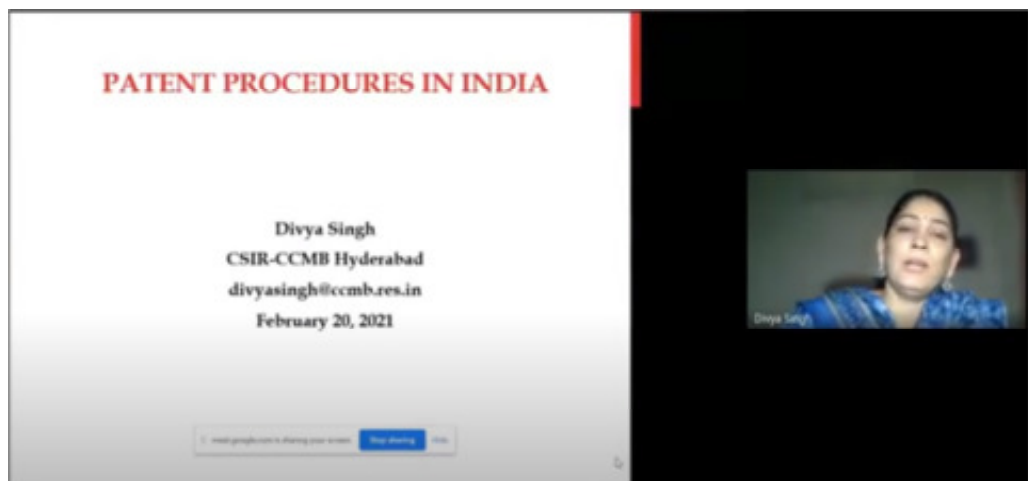
- ***Innovations in Product Development – Examples and Case Studies by Prof. Suman Chakraborty***

Prof. Chakraborty discussed about process of innovating any technology starting from basic science and its further development from lab to market. He presented different case studies based on his own research to obtain patents.



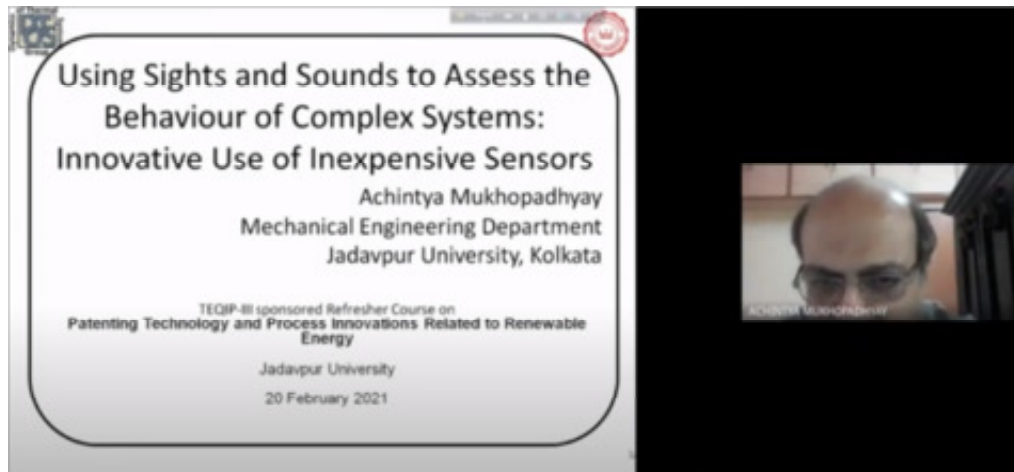
- ***Patent Procedure in India by Ms. Divya Singh***

Ms. Singh discussed the basics and details of the patent procedures in India. She used different case studies pertaining to renewable energy to show the patenting process.



- ***Using Sights and Sound to Access the Behavior of Complex System: Innovative Use of Inexpensive Sensors by Prof. Achintya Mukhopadhyay***

Prof. Mukhopadhyay discussed how innovations can be achieved using simple and inexpensive tools and methods to obtain desired technological advances based on his own research.



Day 5

- ***Patents and Process Innovations: a Perspective by Prof. Pallab Sinha Mahapatra***

Prof. Mahapatra used different case studies based on his own research to illustrate the process of achieving innovations in energy systems leading to patents.



- ***Utilization of High-Performance Computing for Internal Combustion Engines by Prof. Kaushik Saha***

Prof. Saha discussed the importance of high performance computing in research on energy systems and the future scope of development related to renewable energy.



- ***India's Energy Transition by Ms. Ushashi Banerjee***

Ms. Banerjee discussed different aspects of transition from traditional non-renewable sources of energy to renewable energy systems in the Indian context.



Day 6

- ***Taking Innovation from Lab to Market by Prof. Subhrangshu Sanyal***

Prof. Sanyal discussed different aspects of innovation in the lab and its commercialization in the market.



- ***Ride the Clean Energy Protection Wagon by Mr. Ayush Sharma***

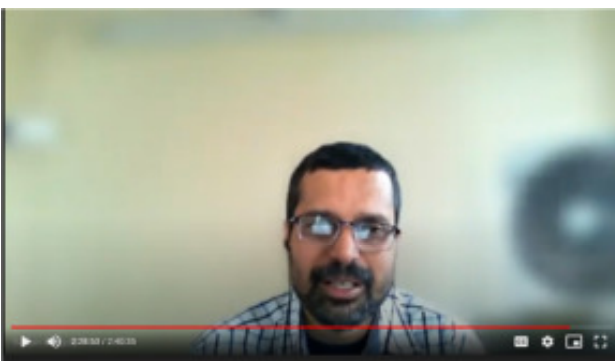
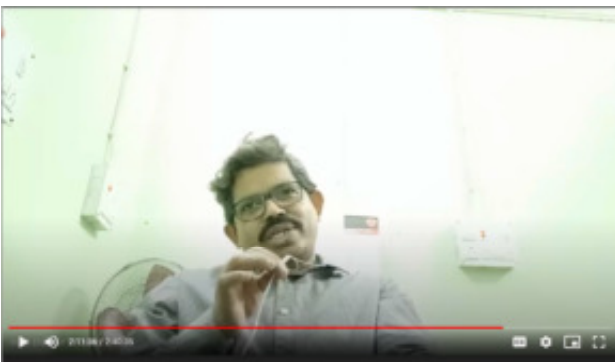
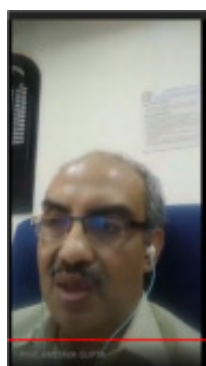
Mr. Sharma discussed different aspects of filing patents related to renewable energy and illustrated the same using various case studies.



- ***Question-Answer Session by Prof. Amitava Gupta, Prof. Ranjan Ganguly, Prof. Ratan Mondal, Prof. Sayan Chatterjee, Prof. Sudipta De, Prof. Achintya Mukhopadhyay and Dr. Mahuya Hom Chowdhury***

The dignitaries expressed their gratitude for successful completion of the *Faculty Development Program* on **Patenting Technology and Process innovations Related to Renewable Energy**. Different issues related to patenting process were discussed and it

was proposed that a long-term collaboration be undertaken between Jadavpur University and the Department of Science and technology, Govt. of West Bengal for expediting the patenting process.



~::~ End of the Report ::~